Advanced Pumping Efficiency Program

Helping California...

Policies and Procedures Manual

What’s Inside:

I. What is the Advanced Pumping Efficiency Program? . . . . . . 1
II. How Long is APEP Active? . . . . . . . . . . . . . . . . . . 1
III. What Does APEP Do? . . . . . . . . . . . . . . . . . . 1
IV. Who is Eligible to Participate? . . . . . . . . . . . . . . . . . 1
V. How Can I Participate? . . . . . . . . . . . . . . . . . . 2
VI. How Do I Contact APEP? . . . . . . . . . . . . . . . . . . 2
VII. More About Pump Efficiency Tests . . . . . . . . . . . . . 2
VIII. More About the Incentives for Pump Retrofit or Replacement . . . . . . . . . . . . . 5
IX. Important Time Limits on Application Approval and Project Completion 6
X. How Are Incentives Calculated? . . . . . . . . . . . . . . . . . 7
XI. Examples of Incentive Calculations . . . . . . . . . . . . . 10
XII. How Do I Apply for an Incentive? . . . . . . . . . . . . . . . . . 12
XIII. How Do I Register a Complaint? . . . . . . . . . . . . . . 13
XIV. Agreement to be Signed When Applying for an Incentive . . . . 14

The information in this Policies and Procedures manual is current as of November 8, 2013. The Advanced Pumping Efficiency Program (APEP) may be modified or terminated at any time. Please contact the main APEP Program Office for up-to-date information, especially if you are applying for an incentive for a pump retrofit/replacement project. The APEP Program Office can be contacted by calling toll free, 1 (800) 845-6038. You may also log on to the APEP web site at www.pumpefficiency.org for more information and a knowledge-base for pumping efficiency.

APEP Development and Management by:

Center for Irrigation Technology - California State University, Fresno
5370 North Chestnut Avenue – M/S OF18
Fresno, CA 93740-8021
(559) 278-2066
Peter Canessa – Program Manager

Pacific Gas & Electric Company
P.O. Box 77000
San Francisco, CA 94177
Elisa Brossard
Senior Program Manager - Customer Energy Efficiency Programs

IMPORTANT!
California consumers are not obligated to purchase any full fee service or other service not funded by this program. This program is funded by California utility ratepayers under the auspices of the California Public Utilities Commission.

Los consumidores en California no estan obligados a comprar servicios completos o adicionales que no esten cubiertos bajo este programa. Este programa esta financiado por los usuarios de servicios públicos en California bajo la jurisdiccion de la Comisión de Servicios Públicos de California.
The Advanced Pumping Efficiency Program

I. What is the Advanced Pumping Efficiency Program?
The Advanced Pumping Efficiency Program (APEP) is an educational and incentive program intended to improve overall water pumping efficiency and encourage energy conservation in California.

APEP is available through Pacific Gas and Electric Company’s Customer Energy Efficiency offerings, funded through the Public Purpose Programs Charge under the auspices of the California Public Utilities Commission. This is a fee paid by all accounts of the major investor-owned utilities in California including PG&E, Southern California Edison Company, Southern California Gas Company, and San Diego Gas and Electric Company. The purpose of this fee is to fund activities that improve energy efficiency and promote energy conservation.

II. How Long is APEP Active?
APEP has funding currently authorized through December 31, 2014. However, APEP may be terminated or modified without notice. This program has a limited budget. Requests for pump efficiency tests or applications for an incentive for a pump retrofit/replacement are accepted on a first-come, first-served basis until available funds are allocated or the end of the program, whichever comes first. Check the APEP web site at www.pumpefficiency.org or call APEP toll-free at (800) 845-6038 for up-to-date information.

III. What Does APEP Do?
APEP has four program components:

1. Education – educational seminars concerning pumping system specification and maintenance, water management, and water measurement will be given throughout the state. The educational message has four parts:
   - Know how to specify an efficient pumping system
   - Know how to maintain an efficient pumping system
   - Know how much water needs to be pumped
   - Know how much water has been pumped

2. Technical Assistance – Program personnel are available to help in locating pump efficiency testers, completing a pump retrofit/replacement incentive application form, or answer general questions as to pumping system design and use. Note that site-specific engineering services are not available (for example, we would not be able to specify the exact pump design for a specific location.)

3. Pump Efficiency Tests – Subsidized tests are available for eligible electric or natural gas-powered water pumps that are 25 horsepower or greater, serviced by a PG&E utility account (see section IV. “Who is Eligible to Participate” for full eligibility requirements).

4. Incentives for Pump Retrofits/Replacements – incentives are available for any size pump to encourage individuals to retrofit/replace eligible, electric or natural gas-powered water pumps to improve overall pumping efficiency. Refer to section IV. “Who is Eligible to Participate” for full eligibility requirements.

IV. Who is Eligible to Participate?
Eligibility extends to all owners or users of a non-residential, PG&E electric or natural gas utility account that is primarily used for pumping water for production agriculture, landscape or turf irrigation, or municipal purposes, including potable and tertiary-treated (reclaimed) water but excluding pumps used for industrial processes, raw sewage, or secondary-treated sewage, and who are paying the Public Purpose Programs Charge. Customers should call APEP first if there is a question concerning their eligibility.
IMPORTANT!
Other factors may apply for individual pump retrofit projects or pump efficiency tests. Carefully read this Policies and Procedures Manual, especially sections VII. and VIII., or contact the APEP Program Office for full eligibility criteria.

V. How Can I Participate?
The following summarizes how individuals can participate in the various APEP activities:

1. Educational seminars - Anyone is welcome to attend the educational seminars. Notices of upcoming seminar dates and locations will be found in agricultural trade publications, on the APEP web site (www.pumpefficiency.org), in local newspapers, and heard on radio and television.

2. Technical Assistance – Available to any eligible participant. Personnel will be available at all educational seminars, at the APEP offices (see section VI. below), and at various other times and locations.

3. Pump Tests – Subsidized pump efficiency tests are available to any eligible PG&E electric or natural gas account of 25 horsepower or more. Pump tests must be performed by one of APEP’s participating pump test companies. All you have to do is contact the participating pump test company of your choice. A list of these companies is available from the APEP Program Office, or on the APEP web site at www.pumpefficiency.org.

IMPORTANT!
Please note that APEP provides the subsidy directly to the pump test company, not to you. This subsidy may or may not cover the total cost of the test. You should have a clear understanding of the total cost of a pump test, and whether you will be liable for any part of that cost, before you authorize a test.

4. Incentives for pump retrofit/replacement – Incentives are available to any eligible PG&E electric or natural gas account for retrofitting/replacing inefficient pumps. You need to fill out an application form and send it to the main APEP Program Office. The form may be obtained by contacting a regional APEP office or downloading the form from the APEP web site at www.pumpefficiency.org. Refer to section VIII. “More About the Pump Retrofit/Replacement Incentive” below.

VI. How Do I Contact APEP?
APEP maintains regional offices in Northern California, the San Joaquin Valley, and the Central Coast. Specific questions regarding the activities of APEP can be answered by contacting one of these offices:

- Northern California – (559) 260-6148
- Main Office – Central/Southern California – (800) 845-6038
- Central Coast (San Mateo County to Ventura County) – (805) 709-4180

APEP also maintains a web site at www.pumpefficiency.org. Here you will find summaries of all Program components, a calendar of upcoming events, a list of participating pump test companies, incentive application forms, phone numbers and E-mail addresses of the regional offices, and a knowledge-base to help you conserve energy and water.

VII. More About Pump Efficiency Tests
All you have to do is contact the participating pump test company of your choice. The results of the test are reported to APEP and PG&E. The results of the pump test will include a calculation of the kilowatt hours or therms needed to pump an acre-foot of water, the overall pumping efficiency, motor loading, power input to the pumping plant, and the estimated energy and dollar savings resulting from a pump retrofit/replacement. A sample report is seen in Figures 1a and 1b.
The knowledge-base on the APEP web site contains a full explanation of the pump test report and how to use the results. A pamphlet is also available from APEP. You can call one of the regional offices or download this pamphlet from the web site.

Test Ranch

**SUBJECT: PUMPING COST ANALYSIS**

HP: 100.0  
Pump: S J RIVER

PUMP TEST REFERENCE NUMBER: Test 1

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from data acquired from the pump test performed 12/13/2002 and information provided by you.

Please pay careful attention to the assumptions. The estimated savings are only valid for the assumptions made and conditions measured during the pump test.

**It is assumed that:**

1. Overall pumping efficiency is improved to: 67.0 %
2. Motor loaded at: 84.4 %
3. Flow rate will be: 1,183.2 gpm
4. Total head will be: 189.3 feet = 16 ft PWL, 75 psi Dis Pres
5. Water requirements will be: 245.1 acre-feet/year

<table>
<thead>
<tr>
<th>EXISTING EFFICIENCY</th>
<th>IMPROVED EFFICIENCY</th>
<th>ESTIMATED SAVINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. kWh/AF:</td>
<td>460</td>
<td>289</td>
</tr>
<tr>
<td>7. Estimated Total kWh:</td>
<td>112,829</td>
<td>70,830</td>
</tr>
<tr>
<td>8. Average Cost per kWh:</td>
<td>$0.16</td>
<td></td>
</tr>
<tr>
<td>9. Average Cost per hour:</td>
<td>$13.46</td>
<td>$10.14</td>
</tr>
<tr>
<td>10. Average Cost Per Acre Ft.:</td>
<td>$74.12</td>
<td>$46.53</td>
</tr>
<tr>
<td>11. Estimated Acre Ft. Per Year :</td>
<td>245.1</td>
<td>245.1</td>
</tr>
<tr>
<td>12. Overall Pumping Efficiency:</td>
<td>42.1%</td>
<td>67.0</td>
</tr>
<tr>
<td><strong>13. Estimated Total Annual Cost:</strong></td>
<td><strong>$18,165.51</strong></td>
<td><strong>$11,403.58</strong></td>
</tr>
</tbody>
</table>

We hope that this information is useful for you in planning your pump maintenance so you can pump more efficiently and save energy and money. Please feel free to contact the APEP Program Office if you have any questions or would like help with next steps at Toll Free, 1(800) 845-6038.

Sincerely,

Peter Canessa

Figure 1a – Sample pumping cost analysis from a pump efficiency test report (report format may be modified at any time).
Advanced Pumping Efficiency Program
(800) 845-6038
Pump Test Report

Pump/Location: Test 1 HP: 100
Utility: PG & E
GPS Coord.: Long N Lat W
Motor Make: Newman Type: Turbine
Customer Addr: Test Ranch

Pump Make: Peerless
Serial Number: 9999T
Pump Test Report

Voltage: 0 Amps: 0
State Well #: 

Contact: Peter Canessa
Phone: (800) 845-6038 Fax: 
Cell: 
PUC Acreage: 321-640 Farm Type: Vineyard

Customer Addr: Test Ranch
Serial Number: 

Test Date: 12/13/2002 Tester: Pete Canessa
Run Number: 1

1. Standing Water Level (Ft): 0
2. Pumping Water Level (Ft): 16
3. Draw Down (Ft): 16.0
4. Recovered Water Level (Ft): 0
5. Discharge Pressure at Gauge (PSI): 75
6. Total Lift (Ft): 189.3

7. Flow Velocity (Ft/Sec): 2.686
8. Measured Flow Rate (GPM): 986
9. Customer Flow Rate (GPM): 0
10. Well Specific Capacity (GPM/Ft draw): 61.6
11. Acre Feet per 24 Hr: 4.4
12. Cubic Feet per Second (CFS): 2.2
13. Horsepower Input to 112.03
14. Percent of Rated Motor Load 102.0
15. Kilowatt Input to Motor 83.58
16. Kilowatt Hours per Acre Foot: 460.4
17. Cost to Pump an Acre Foot $74.12
18. Energy Cost ($ / Hour) $13.46
19. Base Cost per KWh: $0.161
20. NamePlate RPM: 0
21. RPM at GearHead: 0
22. Overall Pumping Efficiency (%): 42.06

All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.

Figure 1b – Sample results and calculations from a pump efficiency test report (report format may be modified at any time).

The Rest of This Page Intentionally Left Blank
IMPORTANT!
Please note the following:

- The performance and results of the pump efficiency tests are the sole responsibility of the pump test company. Any agreement for pump testing that you enter into is a business arrangement solely between the pump testing company and you. Neither PG&E, APEP, the Center for Irrigation Technology, the California State University, Fresno Foundation, the California Public Utilities Commission, nor any other party guarantees the accuracy of the pump test, nor are any of the aforementioned parties guarantors of such company.

- APEP provides the subsidy directly to the pump test company for eligible pump tests, not to you. Currently the subsidy is $200/test for pumps not tested in the 47 months prior to the test date and $100/test for pumps not tested in the 23 months prior to the test date. The subsidy is $50/test for pumps that are in series with another pump (most commonly a booster pump being supplied by a water well). These subsidies may or may not cover the total cost of the test. You should have a clear understanding of the total cost of a pump test, and whether you will be liable for any part of that cost, before you authorize a test.

- Funding for pump tests is limited and is available on a first-come, first served basis. The subsidy and eligibility rules may change at any time based on budgetary constraints. Please contact the main APEP Program Office if you have questions about funding availability and eligibility.

Pump Test Eligibility Rules:
- The pump test must be for the purpose of determining current overall pumping efficiency (OPE).

- Only one subsidized test is allowed per pump in a 23 month period.

- You will have to sign an Access Agreement before the test so that the pump tester has legal access to your property. You will have to sign a Record of Test after the test so that there is proof a test was performed for you.

- Subsidized pump tests are not available for any purpose related to:
  - A real estate transaction (e.g., determine flow, pumping water level, water quality).
  - Satisfaction of a mandate of any federal, state, or local government or quasi-political agency (participants in PG&E’s AG-ICE program are specifically eligible for all parts of APEP).

- Subsidized pump tests are not available for the following conditions:
  - A pump which is in the APEP database already which was previously tested at 30% OPE or less for electric pumps, 20% OPE or less for a submersible pump, and 6% OPE or less for a natural gas-powered pump, unless that pump was retrofitted in the interim.
  - Water wells or any other pump where the true total dynamic head cannot be determined. APEP requires that a subsidized pump test be able to calculate OPE.
  - Any pump powered by less than 25 horsepower as listed on the motor/engine nameplate.

VIII. More About the Incentive for Pump Retrofit/Replacement
Incentives are available only for replacement or retrofit of either or both of the pump bowl and impeller.

Efficiency improvement work can be contracted or performed wholly or partially in-house if such capability exists. For purposes of incentive calculation, in-house rates cannot exceed typical rates charged by the average of the two closest commercial pump service contractors.

Important Pump Retrofit/Replacement Eligibility Requirements:
- Only one incentive can be paid per individual pump in any one six-year period.
• A valid pump efficiency test must be performed before the retrofit project is started and also after the project is completed. These tests cannot be more than three (3) years apart. Copies of the test results must be submitted with the application. These tests do not have to be done by APEP testers but they must be considered accurate by APEP.

• Only one pumping system, with one discharge point, is allowed per APEP incentive application. Note that a well, with a booster pump located at the well site and operating in series with the well, is an eligible pumping system. Projects involving multiple pumping systems are not eligible for APEP incentives. Contact APEP or PG&E to determine whether PG&E has other programs for which your project may be eligible.

• The pumping system must be operational - APEP will not provide an incentive for replacement of a broken or inoperable pumping system.

• The incentive cannot be combined with any other grant, incentive, rebate, or service offered for the project by one of the investor owned utilities or any state or local agency.

• The following are not eligible for incentives under APEP:
  o Retrofits intended to change the operating condition or use of the pumping system, e.g., changing a pump from low pressure flood irrigation to high pressure drip irrigation. (Retrofits intended to compensate for a systemic change in a water table are eligible, however.)
  o Replacements or maintenance activities for electric motors or VFDs as individual projects (however, check with your local PG&E office for other applicable PG&E energy efficiency programs).
  o Replacements or maintenance activities for an engine or gear drive.
  o Pump impeller adjustment.
  o Any actions intended to improve the efficiency of a water well (i.e. any mechanical, chemical, or biological treatment intended to improve the flow of water from the aquifer into the well).
  o Any actions intended to reduce air entrainment.
  o Actions intended to reduce total dynamic head in the system.

• The following actions are not eligible for APEP, but may be eligible under one of PG&E’s other energy efficiency program offerings. Please contact the main APEP Program Office for more information regarding your particular project, or to locate a utility contact. Many programs require that you contact PG&E before construction or installation. Thus, it is very important to contact PG&E as soon as possible when planning the following projects to verify eligibility:
  o Premium High Efficiency Motor retrofits as stand-alone projects (Non Residential Retrofit/SPC offering)
  o Installation of a Variable Frequency Drive (VFD), or any other type of motor controller or power modulator (Non Residential Retrofit/SPC, or Savings By Design new construction offering)
  o New Premium High Efficiency Motors (Savings By Design new construction offering).
  o A new well with Premium Efficiency Motors and/or VFDs (Savings By Design offering)

**IMPORTANT!**
Any agreement for pump retrofit/replacement service work that you enter into is a business arrangement solely between you and the pump service provider. Neither PG&E, APEP, the Center for Irrigation Technology, the California State University, Fresno Foundation, the California Public Utilities Commission, nor any other party is responsible for guaranteeing the services of such pump service provider.

**IX. Important Time Limits on Applications Approval and Project Completion**
There are some important time limitations to be aware of.
• Applicants have two (2) years from the date of the post-project pump test to complete the application, including all required paperwork. If a) applications are not completed within this timeframe, or b) APEP ends, or c) California Public Utility Commission funds for APEP are unavailable or otherwise inaccessible to APEP or PG&E, the application will expire and no incentives will be paid.

• The current application cutoff date for APEP is October 31, 2014. The cutoff date of project completions eligible for an incentive is December 31, 2014 (that is, the project must be operational by December 31, 2014). The cutoff date for a complete application package with Certificate of Completion, copies of the invoices, and the post-retrofit pump test is January 31, 2015.

X. How Are Incentives Calculated?

IMPORTANT!
In consultation with you, APEP staff will perform all incentive calculations if so desired. APEP staff will always double-check all calculations as part of the approval process.

Incentives are calculated based on estimated first-year project energy (kilowatt-hours or therms) and (if an electric account) kilowatt demand savings and are capped at 50% of the project implementation cost.

The energy savings component for electric accounts will be determined using an incentive rate of either $.08/kWh saved or $0.09/kWh saved. A rate of $.08/kWh saved will be used if the application was signed or the project physically started before January 1, 2009. A rate of $.09/kWh saved will be used if the application was signed after December 31, 2008 and the project was physically started after December 31, 2008.

The kilowatt demand savings component will be calculated at the rate of $100/kW. However, no demand savings will be credited for projects started or applications signed before 1/1/2011.

The energy savings component for natural gas accounts will be determined using an incentive rate of either $.80/therm saved or $1.00/therm saved. A rate of $.80/therm saved will be used if the application was signed or the project physically started before January 1, 2009. A rate of $1.00/therm saved will be used if the application was signed after December 31, 2008 and the project was physically started after December 31, 2008.

IMPORTANT!
The twelve (12) months’ energy use prior to the start of the project will be part of the basis for the incentive calculation. There are situations where the immediate 12 months’ energy use before the physical start of the project is not representative of normal energy use. This is most common when a pump has been taken out of service for efficiency problems and there is a significant time lag between then and when the project is actually started. APEP staff will attempt at all times to establish a representative 12 months’ energy use as the basis for the incentive calculation. This may entail using a different 12 month time frame than the absolute previous 12 months or may entail using a 3 year average of energy use depending on the circumstances. However, APEP retains full discretion in determining the 12 month basis. Also, in the event that the Applicant has cogeneration or self-generation facilities note that PG&E shall not pay Incentives for energy savings that exceed Applicant’s annual energy usage from PG&E. Energy and demand savings are limited to the energy and demand purchased from or delivered by the utility on the meter(s) serving the equipment to be installed, for which the utility collects the Public Purpose Programs (PPP) charge. The Annual energy and demand use include usage from Standby Service and less savings associated with pending energy efficiency applications.

IMPORTANT!
APEP reserves the right to audit the post-retrofit pump test at its discretion using an independent pump tester. APEP also reserves the right to use the kilowatt hours, or therms if a natural gas-powered pump,
required to pump an acre-foot of water through the system and the normal amount of water pumped per year as the basis for the potential incentive calculation if OPE cannot be measured with a pump test.

**Project Costs:** Project costs must be estimated, and the actual costs documented when available, with an APEP Application. Project costs can include time (diagnostics, engineering, or labor) and materials directly involved in completing the retrofit of the pump bowl and/or impeller. APEP will specifically not count the costs of a motor or engine replacement or overhaul, gear drive overhaul, motor control replacement, or installation of a variable speed drive as part of the project cost for the purposes of calculating your incentive.

**Calculation Methods:** There are two standard methodologies used for determining the incentive for a pump retrofit/replacement based on energy savings.

**Method 1** – Method 1 should be used for electric and natural gas-powered pumps in these situations:

- It is always used for an electric-powered pump when the pre-retrofit pump efficiency test shows an overall pumping efficiency of 50% or less (40% or less if a submersible pump).
- It is always used for natural gas-powered pumps when the pre-retrofit pump efficiency test shows an overall pumping efficiency of 16% or less.

For electric-powered pumping plants the potential incentive is calculated as:

\[
\text{Incentive} = (0.25 \times \text{kWh}_{\text{annual}} \times \text{kWh RATE}) + (100/\text{KW} \times \text{KW RATE} \times \text{PUMP HP})
\]

Where:

\[
\text{kWh}_{\text{annual}} = 12 \text{ months of energy use}
\]

\[
\text{kWh RATE} = \$0.08/\text{kWh or} \$0.09/\text{kWh depending on when the application was signed and/or the project started as explained above}
\]

\[
\text{KW RATE} = 0.0 \text{ if the project was started or the application signed before January 1, 2011; if started and the application signed after January 1, 2011, it will be 0.07159 for agricultural or turf irrigation pumps and 0.05966 for all other pumps (Municipal, District, Agency, Water Company, etc.)}
\]

\[
\text{PUMP HP} = \text{the nameplate motor horsepower before the retrofit project}
\]

For natural gas-powered pumping plants the potential incentive is calculated as:

\[
\text{Incentive} = \text{RATE} \times 0.25 \times \text{therm}_{\text{annual}}
\]

Where:

\[
\text{therm}_{\text{annual}} = 12 \text{ months of energy use}
\]

\[
\text{RATE} = \$0.80 \text{ or} \$1.00 \text{ depending on when the application was signed and/or the project started as explained above}
\]

**Method 2** – This method is used for pumps in the following situations:

- If an electric-powered pump and the pre-retrofit pump efficiency test shows an overall pumping efficiency greater than 50% (greater than 40% for submersible pumps).
- If a natural gas-powered pump and the pre-retrofit pump efficiency test shows an overall pumping efficiency greater than 16%.
As in Method 1 there are both energy savings and demand savings components of the incentive. The potential energy savings component of the incentive for an electric-powered pump is calculated as:

\[
\text{Incentive} = \text{kWh RATE} \times (\text{kWh}_{\text{annual}} - (\text{kWh}_{\text{annual}} \times \text{pre-retrofit OPE / post-retrofit OPE}))
\]

Where:

\(\text{kWh}_{\text{annual}}\) = 12 months of energy use

\(\text{OPE} = \text{Overall Pumping Efficiency as tested before (pre-) and after (post-) the project.}\)

\(\text{kWh RATE} = \$0.08\) or \(\$0.09\) depending on when the application was signed and/or the project started as explained above.

The demand savings component of the incentive is calculated as:

\[
\text{Incentive} = \$100/\text{kW} \times \text{kW RATE} \times \text{PUMP HP}
\]

Where:

\(\text{kW RATE} = 0.0\) if the project was started or the application signed before January 1, 2011; if started and the application signed after January 1, 2011 it will be determined as below

\(\text{PUMP HP} = \text{the nameplate motor horsepower before the retrofit project}\)

The kW RATE for agricultural and turf irrigation pumps is found by using Table 1 and the Estimated kWh Savings percentage.

\[
\text{Estimated kWh Savings \%} = 100 \times (1 - (\text{Pre-Project OPE / Post-Project OPE}))
\]

**Table 1 – kW RATE for Agricultural and Turf Irrigation Pumps at Different kWh Savings Percentages**

<table>
<thead>
<tr>
<th>Estimated kWh Savings %</th>
<th>kW RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>0.009694</td>
</tr>
<tr>
<td>10%</td>
<td>0.02237</td>
</tr>
<tr>
<td>15%</td>
<td>0.03729</td>
</tr>
<tr>
<td>20%</td>
<td>0.05369</td>
</tr>
<tr>
<td>25%</td>
<td>0.07159</td>
</tr>
<tr>
<td>30%</td>
<td>0.08874</td>
</tr>
<tr>
<td>35%</td>
<td>0.1044</td>
</tr>
<tr>
<td>40%</td>
<td>0.1163</td>
</tr>
<tr>
<td>45%</td>
<td>0.1260</td>
</tr>
<tr>
<td>50%</td>
<td>0.1320</td>
</tr>
<tr>
<td>55%</td>
<td>0.1357</td>
</tr>
<tr>
<td>60% and above</td>
<td>0.184</td>
</tr>
</tbody>
</table>

The kW RATE for all other pumps is found by using the following equation:

\[
\text{kW RATE} = 0.2386 \times (1 - (\text{Pre-Project OPE / Post-Project OPE}))
\]

The potential incentive for a natural gas-powered pump is calculated as:

\[
\text{Incentive} = \text{RATE} \times (\text{therm}_{\text{annual}} - (\text{therm}_{\text{annual}} \times \text{pre-retrofit OPE / post-retrofit OPE}))
\]
Where:

\[
\begin{align*}
\text{Therm}_{\text{annual}} & = 12 \text{ months of energy use} \\
\text{OPE} & = \text{Overall Pumping Efficiency as tested before and after the project.} \\
\text{RATE} & = \$0.80 \text{ or } \$1.00 \text{ depending on when the application was signed and/or the project started as explained above}
\end{align*}
\]

The following are requirements for post-retrofit pump efficiency tests when using Method 2. Note that APEP reserves the right to audit the post-retrofit test using an independent pump test company:

- If a water well, the pump tests must be at similar discharge pressures (+/- 5 psi of the pre-retrofit discharge pressure) and with a similar standing water level (+/- 10% of the pre-retrofit level).
- If a booster pump, either a) the same pump and impeller trim (if applicable) must be in place before and after the retrofit or b) the tests are at the same operating condition (+/- 10% of pre-retrofit flow and total dynamic head).

XI. Examples of Pump Retrofit/Replacement Incentive Calculations

**Example A:**
Assume the following for an irrigation pump:

- Pre-retrofit OPE is tested at 52%.
- Post-retrofit OPE is tested at 62%.
- Billing data indicates 70,000 kilowatt hours were used in the 12 months prior to the replacement/retrofit.
- The replacement costs $1,500 and was started 10/1/2008.
- The nameplate motor horsepower is 75 HP.

The project started before 1/1/2009, thus:

- kWh RATE = \$.08/kWh
- kW RATE = 0

The maximum Potential Incentive due to the project cost is:

\[
\text{Potential Incentive (maximum)} = .5 \times 1,500 = \$750
\]

Method 2 must be used since the pre-retrofit test results show an OPE of 52%. The Potential Incentive is initially calculated as (note that there is no demand savings component):

\[
\begin{align*}
\text{Incentive} & = \text{kWh RATE} \times (\text{kWh}_{\text{annual}} - (\text{kWh}_{\text{annual}} \times \text{pre-retrofit OPE} / \text{post-retrofit OPE})) \\
& = .08 \times (70,000 - (70,000 \times 52/62)) = \$903.23
\end{align*}
\]

However, since \$750 (50% of the project cost) is the maximum allowable payment, the Potential Incentive is \$750.

(Note that the calculations in the equation proceed as follows:)
1. Divide 52 by 62;
2. Then multiply the result by 70,000
3. Then subtract the result from 70,000
4. Then multiply the result by .08

Depending on how you round the numbers during the calculations you will get an answer of more or less $903.)

**Example B:**
Assume the following for an irrigation pump:

- Pre-retrofit pumping efficiency is tested at 52%.
- Post-retrofit pumping efficiency is tested at 62%.
- Billing data indicates 70,000 kilowatt hours were used in the 12 months prior to the retrofit/replacement.
- The replacement costs $4,000 and the project started 1/15/2011.
- The nameplate motor horsepower is 75 HP.

The project started after 1/1/2009, thus:

- kWh RATE = $.09/kWh
- kW RATE will depend on the kWh savings

The maximum Potential Incentive due to the project cost is:

\[
\text{Potential Incentive (maximum)} = .5 \times \$4,000 = \$2,000
\]

Method 2 must again be used and the energy savings component of the Potential Incentive is initially calculated as:

\[
\text{Incentive (energy)} = \text{kWh RATE} \times (\text{kWh annual} - (\text{kWh annual} \times \text{pre-retrofit OPE} / \text{post-retrofit OPE}))
\]

\[
\text{Incentive (energy)} = .09 \times (70,000 - (70,000 \times 52/ 62)) = \$1,016.13
\]

To calculate the demand savings component of the Potential Incentive, the energy savings are first calculated as:

\[
\text{kWh savings} = (70,000 - (70,000 \times 52/ 62)) = 11,290 \text{ kWh}
\]

As a percentage this is:

\[
\text{kWh savings \%} = 100 \times \frac{11,290}{70,000} = 16\%
\]

Prorating between the KW RATE for 15% and 20% in Table 1 it is seen that the kW RATE is .04057. Thus, the demand savings component of the incentive is calculated as:

\[
\text{Incentive (demand)} = $100/kW \times \text{kW RATE} \times \text{PUMP HP}
\]

\[
\text{Incentive (demand)} = $100 \times .04057 \times 75 = \$304.28
\]

Thus, the total Potential Incentive due to energy and demand savings equals:
Incentive (total) = $1,016.13 + $304.28 = $1,320.41

Since this is less than the maximum incentive permissible due to the 50% project cost cap, the Potential Incentive is $1,320.41.

The above examples indicate that calculating a Potential Incentive can be complicated. APEP staff, in consultation with you, will perform all calculations, both to estimate your Potential Incentive before starting a retrofit project and after it is finished and the actual results are available.

XII. How Do I Apply for a Pump Retrofit/Replacement Incentive?

1. Obtain an Application form. Call your PG&E account representative, call one of APEP’s offices, or log on to the APEP web site at www.pumpefficiency.org. Your pump repair company or pump test company may also have applications for distribution.

2. Read Sections I., II., and III. Fill out Section IV., the Agreement, completely. Read all statements in Section IV.4 carefully. By signing this Agreement you are certifying that these statements are true. **YOU ARE NOT COMMITTING TO COMPLETING THE PUMP RETROFIT BY SIGNING THE APPLICATION!** The application is only an agreement regarding the incentive that you might be paid to you. Chapter XIV. of this document contains a copy of the Agreement.

3. Complete Section V. Calculation of Potential Incentive. APEP, in consultation with you, will perform all calculations if you wish.

4. Fill out Section VI. Project Description as much as possible.

5. KEEP the Certificate of Completion.

6. Make a copy of the application and supporting documentation for your records and mail or fax the following to the Advanced Pumping Efficiency Program:
   - The original Sections IV., V. and VI. of the Application.
   - Copy of a pump efficiency test performed prior to the start of the project. The testing company does not have to be an APEP participating pump test company but the test must be deemed accurate by APEP.

7. We will notify you of Application acceptance or the need for more information.

8. If the Application is accepted, and when the project is complete, paid for, and the post-retrofit pump test completed, mail the following to APEP:
   - The Certificate of Completion, including the start and finish dates of the project.
   - Copies of invoices marked PAID by the pump service company, or copies of cancelled checks along with invoices.
   - Copy of the post-retrofit pump efficiency test performed no more than three (3) years after the pre-project pump test.

**IMPORTANT!**
The documentation of Annual energy use must be copies of utility bills or a summary of energy use prepared by the utility. If you cannot find the last 12 months’ bills showing energy usage, call your local...
PG&E account representative, visit www.pge.com, call the PG&E Business Customer Service Center at 1-800-468-4743 to obtain a record, or call the APEP main office at 1-800-845-6038.

IMPORTANT!
The invoices must clearly state all work that was performed, including replacement of parts, labor, and diagnostics.

All material should be mailed to:

Advanced Pumping Efficiency Program
Center for Irrigation Technology
6014 North Cedar
Fresno, CA 93710

XIII. How Do I Register a Complaint?
Participants in the Advanced Pumping Efficiency Program who have complaints of any form can submit these complaints in the following manner:

1. The first step is to file the complaint with the main APEP Program Office by calling toll free 1 (800) 845-6038 and notifying APEP that you would like to file a complaint. The APEP representative will document your complaint and APEP personnel will respond to the complaint in five (5) working days. There is also a feedback form on the web site at www.pumpefficiency.org where an e-mail message can be sent to APEP that is specifically marked as a complaint.

2. If you do not hear from APEP within five working days, or are not satisfied with APEP’s response, you may submit your complaint to Pacific Gas and Electric Company by e-mailing your complaint to Elisa Brossard at ejss@pge.com or by mailing a letter of Complaint to Elisa Brossard, Agricultural and Food Processing, Mail Code N6G, PG&E, P.O. Box 770000, San Francisco, CA 94177.

3. If you are not satisfied with the response from either or both of APEP or Pacific Gas and Electric Company you can submit your complaint directly to the Public Utilities Commission by calling 1-800-649-7570, Monday – Friday, 8:30 AM - 3:00 PM, by mailing a letter of Complaint to California Public Utilities Commission, Consumer Affairs Branch, 505 Van Ness Avenue, San Francisco, CA 94102-3298, or by filing an online complaint by going to http://www.cpuc.ca.gov/static/forms/complaints/filecomplaint.htm

XIV. Copy of the Agreement to be Signed When Applying for a Retrofit Incentive
Following is a copy of the Agreement that you will sign when applying for a retrofit incentive. By signing this agreement you are certifying that all statements are true. YOU ARE NOT COMMITTING TO COMPLETING THE RETROFIT BY SIGNING THIS AGREEMENT! It is only an agreement regarding the incentive that might be paid to you and the stipulations regarding that payment. There are 21 clauses in the Agreement.

IV.4 Agreement - read this carefully!

The following is an Agreement between PACIFIC GAS and ELECTRIC COMPANY (“PG&E”) and you, the “APPLICANT”.

I, the Applicant, agree to the following terms and conditions:

1. I have read and understand Sections I., II., and III. of this Application. I have read and understand the Policies and Procedures Manual of the Advanced Pumping Efficiency Program (“Program”) operating in the PG&E territory, especially those parts pertaining to the application for, and
calculation of, the incentive for a pump retrofit/replacement. I am an eligible Applicant, and this is an eligible pump retrofit/replacement project under the terms of the Program. I plan to purchase and install the equipment indicated in Section VI. of this Application. This will be for use at my place of business and not for resale.

2. If a tenant, Applicant is responsible for obtaining the property owner’s permission to install the Measure(s) for which Applicant is applying for an Incentive payment. Applicant’s signature on this Application indicates Applicant has obtained this permission.

3. The information I have supplied and included with this Application is true, correct, and complete.

4. If my application is deemed to be incomplete or incorrect by the Program, I agree to supply additional information or application corrections within three (3) months from the date of application. I understand that if I do not supply the information or corrections within this time period, the application shall be deemed expired and PG&E shall not have an obligation to the Applicant.

5. I agree that an approved Application shall expire and no incentive paid if; a) the Application is not completed, including submittal of the Certificate of Project Completion and all supporting documentation to the Program within two (2) years of the post-project pump test or b) the Program ends or c) California Public Utility Commission funds for the Program are unavailable or otherwise inaccessible to the Program and PG&E.

6. I agree that the maximum incentive that I can receive is the Potential Incentive calculated in Section V. of this Application as of the date of Application approval.

7. I certify that this pumping system, pump and power source was operational at the time of the retrofit/replacement. I further certify that this is solely to improve the operating efficiency of the pumping system and not for the purposes of substantially changing the intended operating condition of the pumping system, (e.g., from low pressure to high pressure operation).

8. I have read and understand the terms and conditions on this Application and agree to abide by the rules, requirements, and terms set forth on this Application.

9. If this Agreement is terminated for any reason, PG&E shall not be liable to the Applicant for damages or compensation of any kind.

10. I will supply documentation establishing paid proof-of-purchase. This will be done by attaching copies of all invoices marked “PAID” by the repair company to the Certificate of Project Completion and submitting the Certificate to the Program. I have attached documentation, or will supply documentation, establishing electricity use and pump performance as required by the terms of the Program.

11. PG&E reserves the right to determine the Applicant's eligibility for the Incentive program.

12. NEITHER PG&E NOR THE CALIFORNIA STATE UNIVERSITY, FRESNO FOUNDATION (“FOUNDATION”) MAKES ANY REPRESENTATION OR WARRANTY, NOR ASSUMES ANY LIABILITY WITH RESPECT TO QUALITY, SAFETY, PERFORMANCE, OR OTHER ASPECT OF ANY DESIGN, SYSTEM OR EQUIPMENT INSTALLED OR REPAIRED PURSUANT TO THIS AGREEMENT, AND THEY EXPRESSLY DISCLAIM ANY SUCH REPRESENTATION, WARRANTY OR LIABILITY. APPLICANT AGREES TO INDEMNIFY PG&E, THE TRUSTEES OF THE CALIFORNIA STATE UNIVERSITY, THE FOUNDATION, CALIFORNIA STATE UNIVERSITY, FRESNO, AND ANY OF SAID ENTITIES’ AFFILIATES, SUBSIDIARIES, PARENT COMPANY, OFFICERS, DIRECTORS, AGENTS, AND EMPLOYEES AGAINST ALL LOSS,
13. Both funding and the conditions of the Incentive are subject to the jurisdiction of the California Public Utilities Commission (CPUC) and shall be subject to such changes or modifications as the CPUC may, from time to time, direct in the exercise of its regulatory authority. If there are changes in the Incentive, PG&E will endeavor, but cannot guarantee, to provide a reasonable period of time before changes go into effect.

14. I understand that if the Program is modified in any way or terminated by order of any government entity, then this Agreement shall be revised or terminated consistent with that order.

15. PG&E may assign this Agreement, in whole or in part, or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise, without the Applicant’s prior written consent, provided PG&E remains obligated for payments incurred prior to the assignment. The Applicant may not assign this Application, in whole or in part, or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise without the prior written consent of PG&E.

16. I understand the Incentive requires inspections and measurements of the improved performance of the efficiency project. Therefore, I agree to provide access to the Project Site for these purposes to PG&E and/or its agents or assigns and the CPUC and/or its agents or assigns.

17. Funding approved for this Program is limited and will be paid on a first-come, first-served basis to qualified applicants. Funds will only be reserved upon Applicant’s acceptance into the Program. This Incentive offer is subject to the availability of authorized funds.

18. I agree to release PG&E, the Trustees of the California State University, the Foundation, California State University, Fresno, and all of said entities’ affiliates, subsidiaries, parent company, officers, managers, directors, agents, and employees from all claims, demands, losses, damages, costs, expenses, and liability (legal, contractual, or otherwise), which arise from or are in any way connected with any: (1) injury to or death of persons, including but not limited to employees of PG&E, Foundation, Applicant, or any third party; (2) injury to property or other interests of PG&E, Foundation, Applicant or any third party; (3) violation of local, state, or federal common law, statute, or regulation, including but not limited to environmental laws or regulations; (4) energy savings shortfall; so long as such injury, violation, or shortfall (as set forth in (1) - (4) above) arises from or is in any way connected with the Project, including any third party’s performance of or failure to perform the Project, however caused, regardless of any strict liability or negligence of PG&E, Foundation, or said entities’ officers, managers, or employees.

19. I certify that no other grant, incentive, rebate, or service from a utility, state, or local government-sponsored program has been, or will be, received in connection with the equipment purchased and installed under this contract. I authorize you to receive any and all information about me, or related to me, that you deem sufficient from any other energy efficiency program in order to verify this.

20. PG&E may suspend or terminate my Application, without cause, upon written notice to me.

21. I understand and agree the implementation of this Project shall comply with all applicable federal, state, and local laws, rules and regulations, and all applicable licenses and permits must be obtained. If permits or licenses are required, Applicant must provide certification of this before incentives or rebates are paid.